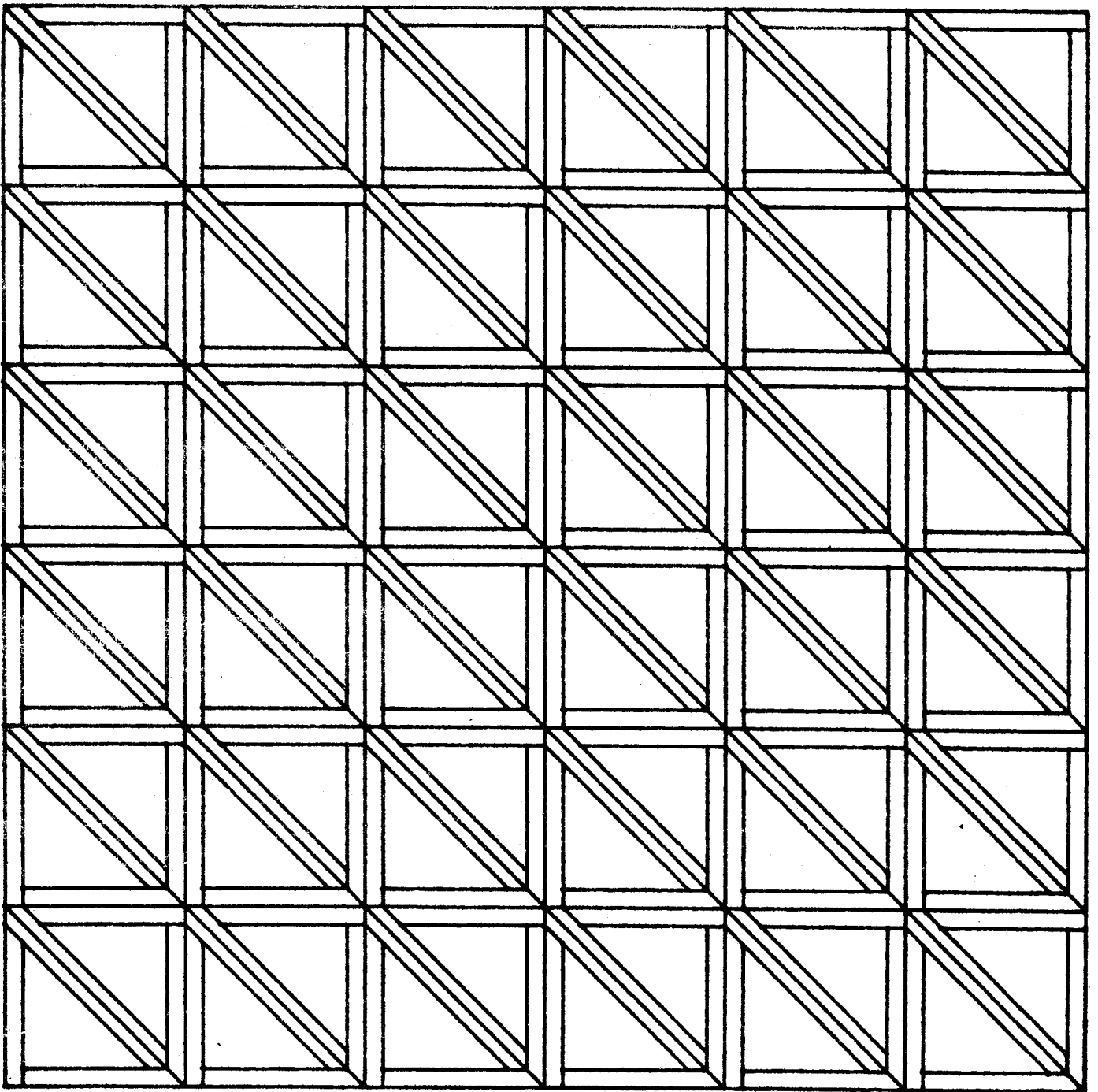
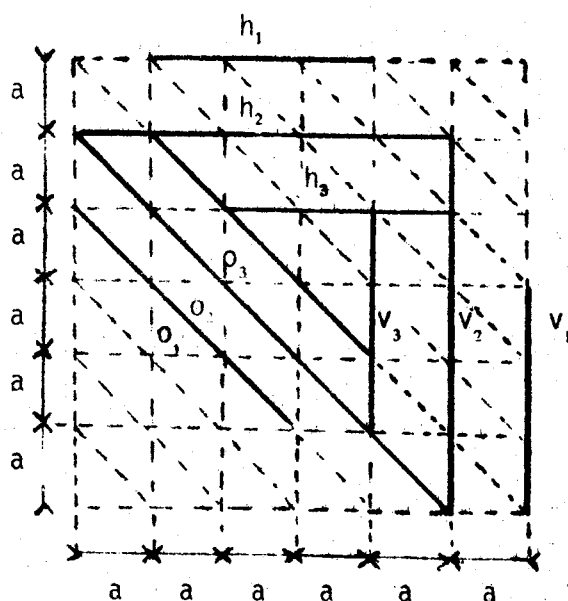


IMPOSSIBLE CRISTAL

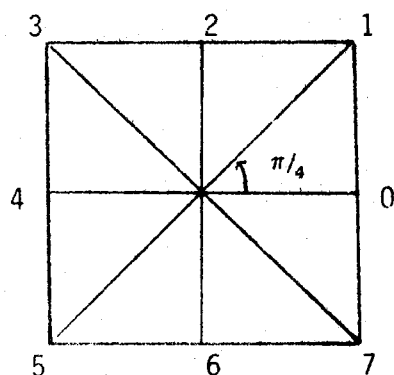
JEAN-ERIC SCHOETTL
& HARALD WERTZ



Voici une version LSE du programme qui fait tracer le dessin illusoire bien connu inspiré par M.C. Escher.



Le motif de base : 3 traits horizontaux (h_1, h_2, h_3) , 3 traits verticaux (v_1, v_2, v_3) , 3 traits obliques (o_1, o_2, o_3) . a donne



Le pas élémentaire de la traçante et les 8 directions 0...7. 8 et 9 sont réservées aux lever et baisser de plume.

Un pas oblique : un pas droit $\times \sqrt{2}$

```
1  <(<*****>
2  <<
3  <<          I M P O S S I B L E   C R I S T A L
4  <<
5  <(<*****>
6
7  MAIN PROCEDURE DESSIN
8
9  .COMMON SECTION COM
10  REF PROCEDURE PASELN;
11  WORD I,J,N,A,AF2,AF8,AF9,AF10,AFN10;
12  WORD DIR,NPAS;
13  ARRAY 10 BYTE TQA=(*BD,*OA,"QUEL A? ");
14  LPFILE QA=(MODE:OUTPUT,EM;EU:TS;DATA:TQA;EDE:10;CONTROL);
15  ARRAY 10 BYTE TQN=(*BD,*OA,"QUEL N? ");
16  LPFILE QN=(MODE:OUTPUT,EM;EU:TS;DATA:TQN;EDE:10;CONTROL);
17
18  .KSTORE SECTION PILE
19      RES 50;
20
21  .LOCAL SECTION LOC
22      RES 1;
23  <<
24  <(<*****>
25  <<
26
27  PROCEDURE LEC(DON)
28  .LOCAL SECTION CONTINUE LOC
29  POINTER WORD DON;
30  BYTE NA;
31  LPFILE LPNA=(MODE:INPUT,EM;EU:TK;DATA:NA;EDE:1;CONTROL);
32  .USING LOCAL IS LOC,COMMON IS COM;
33  READ LPNA;
34  &DON:= NA    AND *F;
35  END; <<DE LEC.
36  <<
37  <(<*****>
38  <<
39  PROCEDURE PLUME
40
41  .USING LOCAL IS LOC,COMMON IS COM;
42  RX:= NPAS; RA:= DIR;
43  CALL PASELN;
44  END; <<DE PLUME
45  <<
46  <(<*****>
47  <<
48  PROCEDURE PENUP
```

```

50 .USING COMMON IS COM,LOCAL IS LOC;
51 RX:= 1 ; RA:= 8 ; CALL PASELN;
52 END; << DE PENUP
53 <<
54 << *****
55 <<
56 PROCEDURE PENDOWN
57
58 .USING COMMON IS COM,LOCAL IS LOC;
59 RX:= 1 ; RA:= 9 ; CALL PASELN;
60 END; << DE PENDOWN
61 <<
62 << *****
63 <<
64 PROCEDURE NOB (DIR1,DIR2,DIR3)
65
66 .LOCAL SECTION CONTINUE LOC
67 WORD DIR1,DIR2,DIR3;
68
69 .USING LOCAL IS LOC,COMMON IS COM;
70
71 DO FOR I:=1 STEP +1 UNTIL N;
72 <<
73 << LIGNE CONTINUE
74 <<
75 NPAS:= APN10;
76 DIR:=DIR1;
77 CALL PENDOWN;
78 CALL PLUME;
79 <<
80 << RETOUR
81 <<
82 CALL PENUP;
83 DIR:= DIR2;
84 CALL PLUME;
85 <<
86 << SE DECALER VERS LA DROITE
87 <<
88 DIR:= DIR3;
89 NPAS:= A;
90 CALL PLUME;
91 <<
92 << 1 ERE LIGNE BRISEE
93 <<
94 DIR:= DIR1;
95 DO FOR J:= 1 STEP +1 UNTIL N;
96 NPAS:= AP2;
97 CALL PLUME;
98 CALL PENDOWN;
99 NPAS:= AP8;
100 CALL PLUME;
101 CALL PENUP;
102 END;
103 <<
104 << RETOUR
105 <<
106 DIR:= DIR2;
107 NPAS:= APN10;
108 CALL PLUME;
109 <<
110 << SE DECALER VERS LA DROITE
111 <<

```

```

112 DIR:= DIR3;
113 NPAS:= AP8;
114 CALL PLUME;
115 <<
116 << 2 EME LIGNE BRISEE
117 <<
118 DIR:= DIR1;
119 DO FOR J:= 1 STEP +1 UNTIL N;
120 NPAS:= A;
121 CALL PLUME;
122 CALL PENDOWN;
123 NPAS:= AP8;
124 CALL PLUME;
125 CALL PENUP;
126 NPAS:= A;
127 CALL PLUME;
128 END;
129 <<
130 << RETOUR
131 <<
132 NPAS:= APN10;
133 DIR:= DIR2;
134 CALL PLUME;
135 <<
136 << DECALER VERS LA DROITE
137 <<
138 NPAS:= A;
139 DIR:= DIR3;
140 CALL PLUME;
141
142 END;
143
144 <<
145 << DERNIER GRAND TRAIT
146 <<
147 CALL PENDOWN;
148 NPAS:= APN10;
149 DIR:= DIR1;
150 CALL PLUME;
151
152 END; << DE NOB.
153 <<
154 << *****
155 <<
156 PROCEDURE OB(BINF,BSUP,PAS)
157
158 .LOCAL SECTION CONTINUE LOC
159 WORD BINF,BSUP,PAS;
160
161 .USING LOCAL IS LOC,COMMON IS COM;
162
163 I:= BINF-PAS;
164 DO I:= I+PAS;
165 IF (PAS<0) THEN IF (I<BSUP) THEN EXIT OB; END; END;
166 IF (PAS>0) THEN IF (I>BSUP) THEN EXIT OB; END; END;
167
168 <<
169 << AVANCER SUR LE COTE
170 <<
171 CALL PENUP;
172 IF (PAS>0) THEN
173 DIR:= 2;

```

```

174      NPAS:= AP9;
175      CALL PLUME;
176      ELSE
177      DIR:= 0;
178      NPAS:= AP10;
179      CALL PLUME;
180      DIR:= 6;
181      NPAS:= A;
182      CALL PLUME;
183      END;
184
185      <<
186      << 1 ERE LIGNE BRISEE
187      <<
188      DIR:= 7;
189
190      DO FOR J:= 1 STEP +1 UNTIL I;
191      CALL PENDOWN;
192      NPAS:=AP8;
193      CALL PLUME;
194      CALL PENUP;
195      NPAS:= AP2;
196      CALL PLUME;
197      END;
198
199      <<
200      << RETOUR
201      <<
202      NPAS:=I*AP10;
203      DIR:= 3;
204      CALL PLUME;
205      <<
206      << SE DECALER D'UN CRAN
207      <<
208      DIR:= 2;
209      NPAS:=A;
210      CALL PLUME;
211      <<
212      << LIGNE CONTINUE
213      <<
214      CALL PENDOWN;
215      NPAS:=I*AP10;
216      DIR:= 7;
217      CALL PLUME;
218      <<
219      << RETOUR
220      <<
221      CALL PENUP;
222      DIR:= 3;
223      CALL PLUME;
224      <<
225      << DECALER
226      <<
227      DIR:= 2;
228      NPAS:=A;
229      CALL PLUME;
230      <<
231      << 3IEME LIGNE BRISEE
232      <<
233      DIR:= 7;
234
235      DO FOR J:=1 STEP +1 UNTIL I;

```

```

236      NPAS:= A;
237      CALL PLUME;
238      CALL PENDOWN;
239      NPAS:=AP8;
240      CALL PLUME;
241      CALL PENUP;
242      NPAS:= A;
243      CALL PLUME;
244  END;
245
246  <<
247  <<RETOUR
248  <<
249      DIR:= 3;
250  NPAS:=I*AP10;
251  CALL PLUME;
252  <<
253  << REDESCENDRE UN BRIN
254  <<
255  DIR:= 6;
256  NPAS:= A;
257  CALL PLUME;
258
259  END;
260
261  END;      <<DE OB
262  <<
263  <<      ****
264  <<
265
266
267  .USING KSTORE=PILE,LOCAL=LOC,COMMON=COM;
268
269  WRITE QA;
270  CALL LEC(QA);
271  WRITE QN;
272  CALL LEC(QN);
273
274  A:= 10*A;
275  AP2:= 2*A;
276  AP8:= 8*A;
277  AP9:= 9*A;
278  AP10:= 10*A;
279  APN10:= AP10*N;
280
281  <<
282  << LIGNES HORIZONTALES ET VERTICALES.
283  <<
284  CALL NOB (6,2,0);
285  CALL PENUP;
286  NPAS:= APN10;
287  DIR:=2;
288  CALL PLUME;
289  DIR:=4;
290  CALL PLUME;
291  CALL NOB(0,4,6);
292  CALL PENUP;
293  NPAS:= APN10;
294  DIR:=4;
295  CALL PLUME;
296
297  <<

```


298 << LIGNES OBLIQUES.
299 <<
300 CALL OB(1,N,1);
301 CALL OB(N-1,1,-1);
302
303 END.
304 FIN



URGENT



NE PAS AFFRANCHIR